

Claims

1 1. A method, including steps of determining a set of zones
2 within a block of data; calculating a zone checksum value for each zone
3 within said set of zones; recording said zone checksum value for each zone in
4 association with said block of data; and determining a block portion
5 checksum value for a portion of said block in response to at least one of said
6 zone checksum values for each zone.

1 2. A method as in claim 1, wherein said steps of determining
2 a block portion checksum value include determining a partial zone checksum
3 value for at least one said zone; and combining said partial zone checksum
4 value with said one zone checksum value.

1 3. A method as in claim 1, wherein said steps of determining
2 a block portion checksum value include determining at least one said zone for
3 which to compute a partial zone checksum value; determining said partial
4 zone checksum value in response to a selected portion of said zone; and
5 combining said partial zone checksum value with said zone checksum value
6 for at least one said zone.

1 4. A method as in claim 1, including steps of receiving said
2 block of data from a storage medium.

1 5. A method as in claim 1, including steps of sending said
2 block of data and a result of said step of determining a block portion
3 checksum value to an external device.

1 6. A method as in claim 1, including steps of sending said
2 block of data and said associated checksum values for each zone from a first
3 software element to a second software element.

1 7. A method as in claim 6, wherein said first software
2 element and said second software element are associated with differing
3 layers in a data transfer protocol.

1 8. Apparatus including memory including a block of data,
2 said block of data being separable into a set of zones; memory including a
3 zone checksum value for each said zone; memory including an association of
4 said zone checksum value with each said zone; and memory including a block
5 portion checksum value for a portion of said block, said checksum value for a
6 portion of said block including a combination of at least one of said zone
7 checksum values.

1 9. Apparatus as in claim 8, including memory including a
2 partial zone checksum value for at least one said zone; and memory including
3 a combination of said partial zone checksum value with said zone checksum
4 value for at least one said zone.

1 10. A method, including steps defining a partial block of data
2 from a block of data; determining a set of zones within said block; calculating
3 a zone checksum value for each zone within said set of zones; recording each
4 said zone checksum value for each said zone in an array; associating said
5 array with said block; and combining the checksums within the array.

1 11. A method as in claim 10 wherein combining includes a
2 step of addition.

1 12. A method as in claim 10, wherein said step of calculating
2 a zone checksum values for each zone within said set of zones includes
3 calculating a partial zone checksum value for any partial zones contained in
4 said block associating said partial zone checksum with said checksum array.

1 13. A method as in claim 10, including steps of receiving said
2 block from an external device.

1 14. A method as in claim 13, wherein said external device is a
2 Network Interface Card (NIC).

1 15. A method as in claim 13, wherein said external device is a
2 storage medium.

1 16. A method as in claim 10, including steps of sending said
2 block and a result of said steps of combining to an external device.

1 17. A method as in claim 16, wherein said external device is a
2 Network Interface Card (NIC).

1 18. A method as in claim 17, wherein said external device a
2 storage medium.

1 19. A method as in claim 10, including steps of sending said
2 block and said checksum array from a first software element to a second
3 software element.

1 20. A method as in claim 19, wherein said first software
2 element and said second software element are associated with differing
3 layers in a data transfer protocol.

1 21. A method as in claim 13, including steps of sending said
2 block and said checksum array from a first software element to a second
3 software element.

1 22. An apparatus including memory including a block of data,
2 said block being separable into a set of zones; said memory including a zone

3 checksum value for each said zone; said memory including an association of
4 said zone checksum values with each said zone; and memory including a
5 checksum array including a combination of each said zone checksum values.

1 23. Apparatus as in claim 22, including memory including a
2 partial zone checksum value for at least one said zones; and memory
3 including a combination of said partial zone checksum value with said zone
4 checksum value for at least one said zone.

1 24. Apparatus as in claim 22, wherein said memory includes
2 at least one said partial zone for which to compute a partial zone checksum
3 value; said memory includes said partial zone checksum value associated
4 with a selected portion of said partial zone; and said memory includes a
5 combination of said partial zone checksum value with said zone checksum
6 value for at least one said zone.